

REFERENCES

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18. SEASONAL CHANGES IN THE POPULATION OF
EPILACHNA BEETLE *HENOSEPILOACHNA SPARSA* HERBST.
(COLEOPTERA : COCCINELLIDAE)

(With nine text-figures)

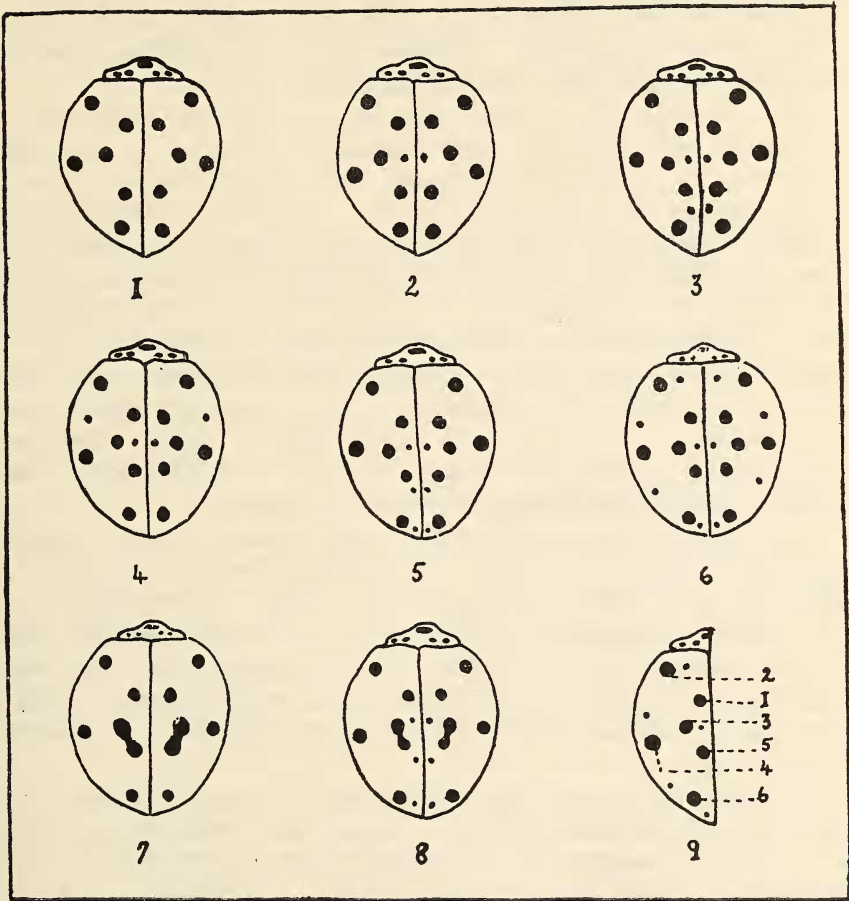
Observations have been made by the authors on the seasonal changes in the population of *Epilachna* beetles, *Henosepilachna sparsa* Herbst. in the field and laboratory. The beetles were reared in the laboratory in rearing cages specially designed by Edona and Soans. Outside the beetles thrive on *Datura fastuosa* in the Malabar Christian College compound. Seasonal changes affect the population both inside the laboratory and outside, but outside the seasonal changes are more pronounced.

The presence of *Epilachna* beetles can be best determined by examining the leaves of *Datura fastuosa*. The leaves are seen eaten up in irregular patches with the thin upper cuticle of the leaf entirely or partly covering those areas. When the underside of these injured leaves is examined, one is likely to find *epilachna* beetles in one stage of development or the other.

The beetle population reaches its highest numerical strength about the middle of October and continues till the end of November. The favourable climatic conditions which succeed the rainy season seem to be responsible for this increase. Beetles breed rapidly and feed voraciously in the field. Both the larvae and adults feed on the under surface of the leaves skeletonizing them and producing a new crop of adults. Dry yellow leaves with practically all the tissue eaten and with a fine net work alone remaining indicates heavy infestation.

In the laboratory also beetles multiply rapidly during these days. Specimens with different elytral maculation appear during this season. The basic elytral maculation consists of 6 black spots always present on each elytron arranged as in fig. 1; but these may be augmented by the presence of 1-5 black non-persistent spots variably present (figures 2-6). Both persistent and non-persistent spots are variable in size, the former

being usually bigger than the latter. Occasionally some spots may coalesce.



Henosepilachna sparsa Herbst. : Figs. 1-9

1. Basic elytral maculation of 6 black spots. 2-6. spot patterns of elytra showing presence of 1-5 non-persistent spots on each elytron. 7-8. coalescence of spots. 9. left elytron, persistent spots numbered 1-6.

From the middle of December throughout January a slight reduction in the population is noticed. This becomes more pronounced in February and in March. By this time only six-spotted beetles are seen and occasionally 7-spotted ones. By April the reduction in the population reaches its climax. Of the insects present only few lay eggs and there is considerable reduction in the number of eggs in each batch. Due to the heat and dry air most of the eggs, larvae, pupae and adults are killed. Mortality is highest in the first and the second instars. The eggs remain dead and dry on the plants ; the larvae and adults are killed

and fall to the ground ; while the pupae are left dark brown and black to dry up on the plants. These conditions are common both in the field and the laboratory. Occasionally a few beetles emerge one at a time during late March and April. But none of these develop normal feeding habits and therefore have a shorter span of life.

By the second week of May when the rains start the temperature is slightly reduced, the beetle population begins to improve in the cages and in the field. Mortality is reduced. More insects begin to appear. The population increases in June and July. When the rainfall increases in the last week of July and at the beginning of August, the normal activities of the beetles are curtailed but rain storms seldom continue without intermission for very long and the temperature is always high enough for activity to be resumed as soon as the rain stops. In August there is a slight reduction in population because the torrential showers wash away the eggs and larvae from exposed places. In September again there is an increase in the population, which continues till the middle of December but reaches its climax in November. By September adult beetles of different elytral maculation begin to appear.

Variations in number among these beetles therefore seem to depend largely on weather conditions. The population increases in numbers and the beetle becomes a major pest in the years of normal temperature and rainfall, but decreases in numbers in years of high temperature and droughts, especially when these periods are prolonged. Thus there was greater increase in numbers in November 1968, when the climatic conditions were more favourable than in November 1969 which was a period of inclement weather.

There were a few places where the mortality was not very high even under generally adverse conditions. Because they contained vigorously growing *Datura* plants which were irrigated and thus protected from unfavourable climate. However inclement climatic conditions may be, it does not seem likely that total eradication of the beetle will occur. The insect either persists on *Datura* throughout the year or is only temporarily held in check by unfavourable weather conditions.

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